

DESCRIPTION OF *ACROTMARUS GUMMOSUS* GEN. NOV. AND SP. NOV. (ARANEAE, THOMISIDAE) FROM XISHUANGBANNA, CHINA

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Abstract A small sized crab spider of the family Thomisidae, subfamily Thomisinae, tribe Tmarini collected from Xishuangbanna, Yunnan, China is studied. *Acrotmarus* gen. nov. is erected to accommodate *Acrotmarus gummosus* sp. nov. The new monotypic genus is diagnosed in this study.

Key words Taxonomy, canopy fogging, tropical rainforest, Southeast Asia.

1 Introduction

Thomisidae is one of the largest spider families including 175 genera and 2 123 species in the world, a total of 63 genera are monotypic and some others with only less than three species (Platnick, 2012). There are 75 genera recorded from Southeast Asia, and 45 genera 274 species from China (Li & Wang, 2012; Murphy & Murphy, 2000; Platnick, 2012; Song & Zhu, 1997). A provisional four clades (subfamilies) of crab spiders had been proposed based the molecular phylogenetic analysis of 25 genera (Benjamin *et al.*, 2008), which differs greatly from the subfamilies of traditional morphological taxonomy in Thomisidae. Subsequently, the higher-lever phylogenetic relationships of Thomisidae were studied from morphological data (Benjamin, 2011).

Xishuangbanna is located at the Southwestern Yunnan Province of China. It borders Myanmar and Laos. Xishuangbanna is included in the Indo-Burma biodiversity hotspots and contains over 5 000 species of vascular plants, which is 16 percent of China's total plant diversity (Cao & Zhang, 1997; Myers *et al.*, 2000). Sixty-two thomisids in 34 genera were recorded from this area (Tang & Li, 2009a, 2009b, 2009c, 2010). In this study, one new genus is described from this area.

2 Material and Methods

Specimens examined were collected from Xishuangbanna Tropical Botanical Garden of Chinese Academy of Sciences (XTBG) in Menglun Town, Mengla County, Yunnan Province. Specimens were examined with an Olympus (Tokyo, Japan) SZX12 stereomicroscope; details were studied with an Olympus BX51 compound microscope. All

illustrations were made using an Olympus drawing tube. Digital images were taken with an Olympus C7070 wide zoom digital camera (7.1 megapixels) mounted on an Olympus SZX12 stereomicroscope and Hitachi S-3000N Scanning Electron Microscope. The multifocus images were assembled using Helicon focus software (ver. 3.10). All measurements are given in millimeters. Eye diameters are taken at the widest point. The total body length does not include the length of the chelicerae or spinnerets. Leg measurements are given as: total length (femur, patella + tibia, metatarsus, tarsus). The terminology used in text and figure mainly follows Ono (1988).

Abbreviations. AER. Anterior eye row. ALE. Anterior lateral eyes. AME. Anterior median eyes. CO. Copulatory opening. CD. Copulatory ducts. E. Embolus. H. Hood; ITA. Intermediate tibial apophysis. MOA. Median ocular area. PER. Posterior eye row. PLE. Posterior lateral eyes. PME. Posterior median eyes. RTA. Retrolateral tibial apophysis. S. Spermatheca. VTA. Ventral tibial apophysis. XTBG. Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Menglun Town, Mengla County, Yunnan Province, China.

Type specimens are deposited in the Institute of Zoology, Chinese Academy of Sciences (IZCAS) in Beijing.

3 Taxonomy

Family Thomisidae Sundevall, 1833

Acrotmarus gen. nov.

Type species: *Acrotmarus gummosus* sp. nov.

Diagnosis. This genus can be easily distinguished from other thomisids genera of Tmarini Simon, 1895 (e. g. *Haplotmarus*, *Monaeses*, *Philodamia*, *Tmarus*) by

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the PLE situated on large swollen tubercles and the embolus with embolar flange, embolus basally wide, flat lamella-shaped, the end with a dent, distally hook-shaped. This genus is similar to *Pherecydes* O. P. - Cambridge (1883), which is also the small thomisid with their lateral eyes situated on highly elevated tubercles (Dippenaar-Schoeman, 1980: 327), but can be distinguished by: only PLE on swollen tubercle (ALE, PLE on highly elevated tubercles in *Pherecydes*); the ratio of PLE-PLE / width of cephalothorax in female = 0.93 (1.29 in *Pherecydes*); the ratio of AME-AME / AME-ALE in female = 0.97 (1.52 in *Pherecydes*).

The genital organs of this genus are different from *Pherecydes* obviously: male palp with VTA (absent in *Pherecydes*), embolus flat lamella-shaped (filiform in *Pherecydes*); epigynum with hood (absent in *Pherecydes*); more differences see descriptions of Dippenaar-Schoeman (1980: 327–340). Photos of one member of *Pherecydes* are given in this study to show the differences between the two genera (Figs 4–5).

Etymology. The specific epithet is a combination of noun *acro* (apex, top) and *Tmarini*, referring to this genus inhabits the high canopy and its similarity to the genera of *Tmarini* in general appearance, masculine in gender.

Phylogenetic position. Judging from the morphological characters, this species belongs to the subfamily Thomisinae Sundevall, 1833, tribe *Tmarini* Simon, 1895.

Distribution. China (Yunnan).

***Acrotmarus gummosus* sp. nov.** (Figs 1–3, 6–21)

Holotype ♂, China, Yunnan, Xishuangbanna, Mengla County, Menglun Town, Xishuangbanna Tropical Botanical Garden, rubber plantation (about 20 years, 21°54'N, 101°16'E; alt. 614 m), 11 Aug. 2007 (Fogging-RZ IV, Zheng-sp200-1).

Paratypes: 3 ♂♂, 3 ♀♀, same data as holotype; 1 ♂, rubber plantation (about 20 years, 21°54'N, 101°16'E; alt. 586 m), 17 July 2007, ZHENG Guo (Fogging-XZ II, Zheng-sp1148); 3 ♂♂, 2 ♀♀, rubber plantation (about 20 years, 21°54'N, 101°15'E; alt. 569 m), 21 July 2007, ZHENG Guo (Fogging-XZ III, Zheng-sp820); 4 ♀♀, *Paramichelia baillonii* plantation (21°54'N, 101°16'E; alt. 556 m), 18 July 2007, ZHENG Guo (Fogging RZ II, Zheng-sp334); 2 ♂♂, secondary tropical seasonal moist forest (21°54'N, 101°17'E; alt. 633 m), 28 July 2007, ZHENG Guo (Fogging-JS III, Zheng-sp915); 1 ♂♂, secondary tropical montane evergreen broad-leaved forest (21°57'N, 101°12'E; alt. 888 m), 4 Aug. 2007, ZHENG Guo (Fogging CB III, Zheng-sp905); 3 ♂♂, 2 ♀♀,

secondary tropical montane evergreen broad-leaved forest (21°54'N, 101°12'E; alt. 876 m), 5 Aug. 2007, ZHENG Guo (Fogging-CB IV, Zheng-sp1288); 6 ♂♂, 2 ♀♀, secondary tropical montane evergreen broad-leaved forest (21°57'N, 101°11'E; alt. 895 m), 6 Aug. 2007, ZHENG Guo (Fogging-CBI, Zheng-sp1238); 5 ♂♂, 1 ♀♀, secondary tropical montane evergreen broad-leaved forest (21°54'N, 101°11'E; alt. 880 m), 6 Aug. 2007, ZHENG Guo (Fogging-CB II, Zheng-sp98); 1 ♀, *Paramichelia baillonii* plantation (21°53'N, 101°17'E; alt. 613 m), 18 Aug. 2007, ZHENG Guo (Fogging-RZ III, Zheng-sp291); 1 ♂, *Paramichelia baillonii* plantation (21°53'N, 101°17'E; alt. 613 m), 18 Aug. 2007, ZHENG Guo (Fogging-RZ III, Zheng-sp289); 1 ♂, Lvshilin Forest Park, limestone tropical seasonal rain forest (21°54'N, 101°16'E; alt. 652 m), 15 Nov. 2009, TANG Guo and YAO Zhi-Yuan (Tang-Yao_ No. 9).

Comparative material. *Pherecydes* sp., 2 ♀♀ (Figs 4–5, the first author examined at California Academy of Sciences (CAS) in 2007).

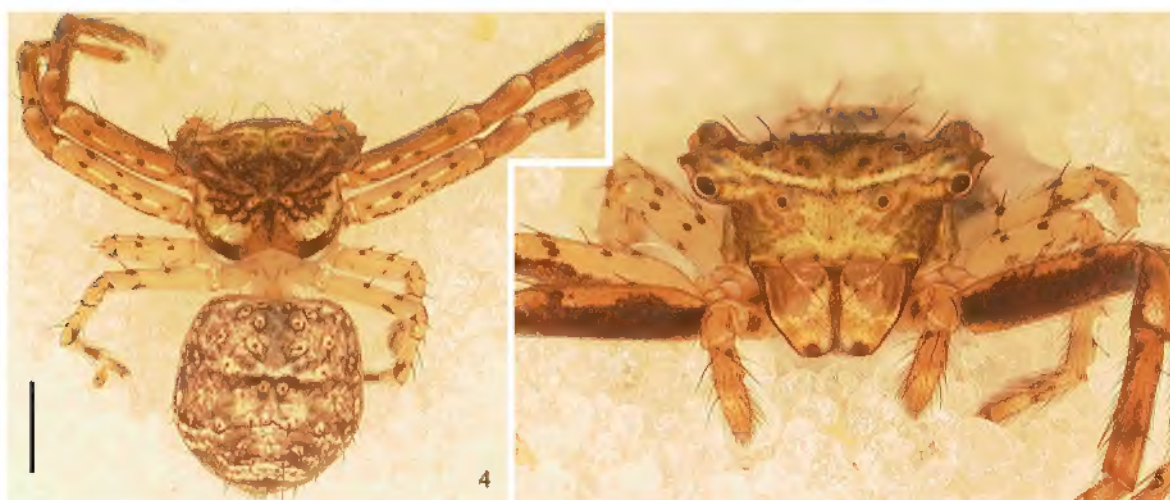
Etymology. The specific name derives from the Latin adjective *gummosus* (gluey), referring to rubber plantation, from where a part of specimens were collected.

Description. Male (holotype measured). Total length 2.90. Prosoma 1.40 long, 1.45 wide; opisthosoma 1.50 long, 1.40 wide. Cephalothorax tent-shaped, dorsal shield of prosoma reddish brown with blackish brown sides. Eye tubercles greyish white with black patches, tubercles of PLE large and conspicuously swollen. Eye measurements: AME 0.07; ALE 0.13; PME 0.06; PLE 0.06; distance AME-AME 0.16; distance AME-ALE 0.16; distance PME-PME 0.30; distance PME-PLE 0.30. MOA length 0.40 with front width 0.30 and back width 0.42. Chelicerae dark brown, gnathocoxae and labium grey, sternum light yellow. Legs light yellow. Spinulation: femur I prolateral 1-1-1, I – IV dorsal 1-1-1; patella I – IV pro-, retrolateral 1-0, dorsal 1 (weak) -1; tibia I – IV dorsal 1-1, I – II pro-, retrolateral 1-1-1, I ventral 2-2, II ventral 0-2, III – IV pro-, retrolateral 0-1; metatarsus I – II pro-, retrolateral 1-1, ventral 2-2, III – IV pro-, retrolateral 1, ventral 2-0. Leg measurements: I: 5.30 (1.50, 2.00, 1.20, 0.60); II: 5.50 (1.60, 2.00, 1.20, 0.70); III: 4.20 (1.30, 1.50, 0.90, 0.50); IV: 4.30 (1.40, 1.50, 0.90, 0.50), leg formula: 2-1-4-3. Opisthosoma dorsally greyish white with greyish brown setae, ventrally yellow.

Palp (Figs 7–9, 15–16, 19–21). VTA long, distally beak-shaped; ITA combined with RTA basally; RTA with a small, spine-shaped apophysis; tegulum flat; embolus wide, flat lamella-shaped, distally



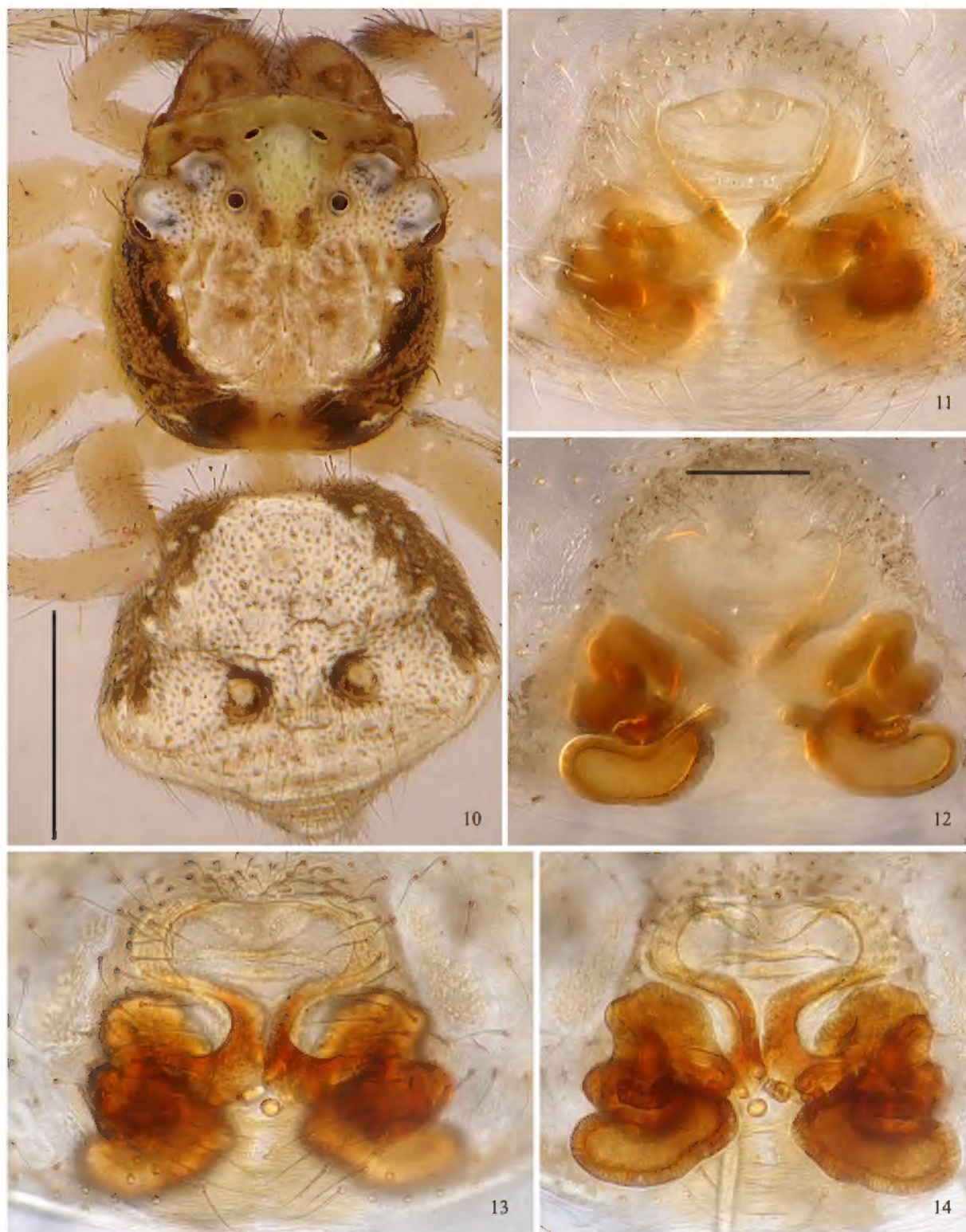
Figs 1–3. *Acrotmarus gummosus* sp. nov. 1–3. Habitus. 1. Male, lateral view. 2. Male, front view. 3. Female, front view. Scale bars = 1 mm.



Figs 4–5. *Pherocydes* sp., from Africa, photos took by TANG Guo at California Academy of Sciences, female habitus. 4. Dorsal view. 5. Front view. Scale bar = 1 mm.



Figs 6–9. *Acrobmarus gummosus* sp. nov., holotype. 6. Male habitus, dorsal view. 7–9. Palp. 7. Prolateral view. 8. Ventral view. 9. Retrolateral view. Scale bars; 6 = 1.0 mm, 7–9 = 0.1 mm.

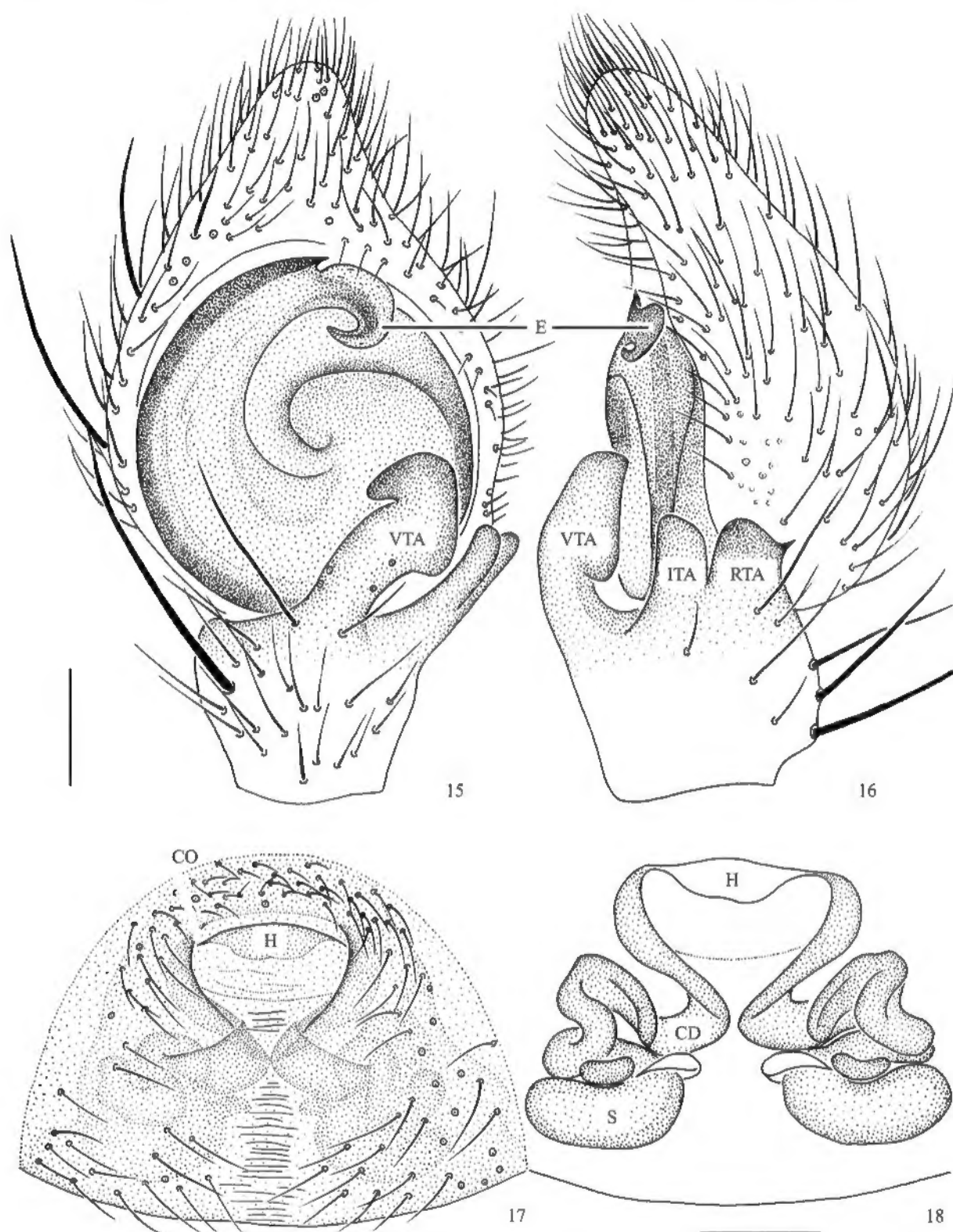


Figs 10 – 14. *Acrotmarus gummosus* sp. nov., one paratype. 10. Habitus, dorsal view. 11, 13. Epigynum, ventral view. 12, 14. Vulva, dorsal view. Scale bars: 10 = 1.0 mm; 11 – 14 = 0.1 mm.

curved hook-shaped.

Female (paratype, Zheng-sp200-2). Total length 3.30. Prosoma 1.60 long, 1.80 wide. Opisthosoma 1.90 long, 1.90 wide. Body pigmentation lighter than in male. Dorsal shield of prosoma greyish yellow with brown sides. Eye measurements: AME 0.08; ALE

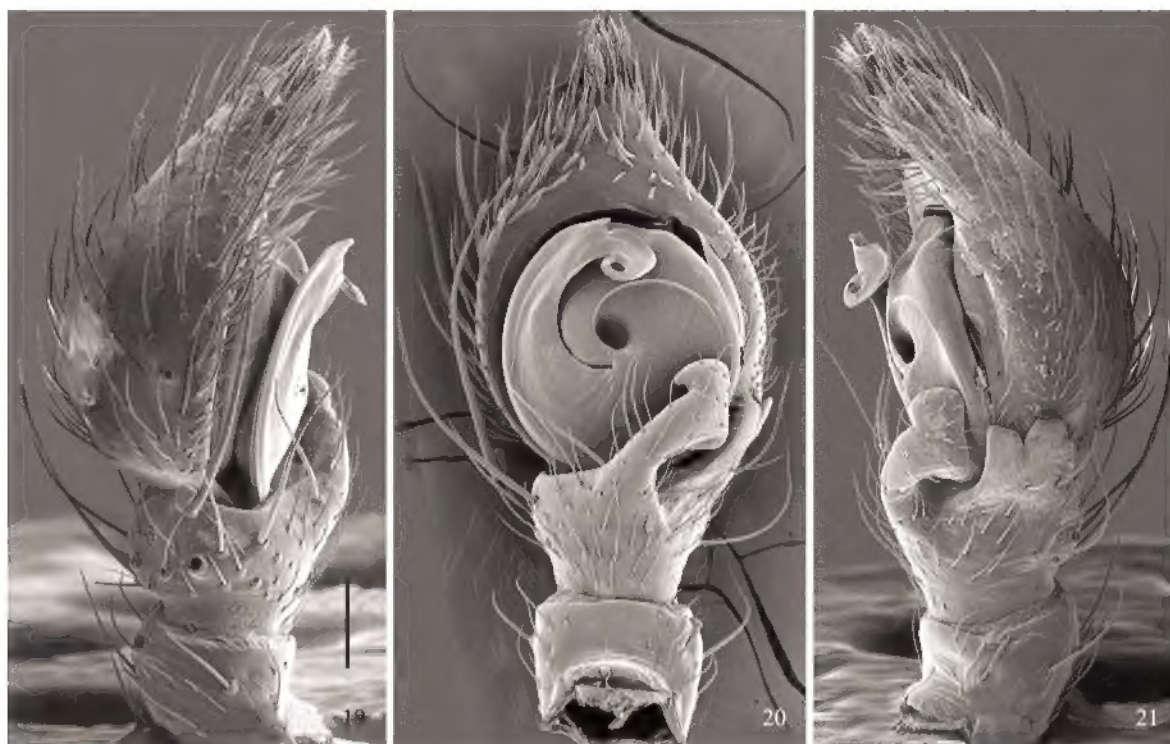
0.13; PME 0.08; PLE 0.12; distance AME-AME 0.24; distance AME-ALE 0.24; distance PME-PME 0.38; distance PME-PLE 0.38. MOA length 0.42 with front width 0.38 and back width 0.54. Leg light yellow. Spinulation: femur I prolateral 1-1-0, I – III dorsal 1-1, IV dorsal 0-1; patella I – IV dorsal



Figs 15 – 18. *Acrotmarus gummosus* sp. nov. 15 – 16. Palp. 17. Epigynum. 18. Vulva. 15, 17. Ventral view. 16. Retrolateral view. 18. Dorsal view. Scale bars = 0.1 mm.

(weak) 1 – 1; tibia I – II dorsal (weak) 1 – 1, III – IV dorsal (weak) 0 – 1, I ventral 1 (weak) – 2, II ventral 0 – 2; metatarsus I – II pro-, retrolateral 0-0-1, ventral 2-2-0. Leg measurements: I: 5.20 (1.60, 2.00, 1.00, 0.60); II: 5.50 (1.60, 2.10,

1.00, 0.80); III: 4.20 (1.30, 1.50, 0.80, 0.60); IV: 4.50 (1.40, 1.50, 1.00, 0.60), leg formula: 2143. Opisthosoma dorsally greyish white with a pair of greyish black patches, laterally greyish brown, ventrally greyish white.



Figs 19–21. *Acrotmarus gummosus* sp. nov., palp. 19. Prolateral view. 20. Ventral view. 21. Retrolateral view. Scale bar = 0.1 mm.

Epigynum (Figs 11–14, 17–18). Epigynum with an anterior hood; copulatory openings situated on the laterals; copulatory ducts slender, twisted; spermathecae kidney-shaped.

Variations. Total length: ♂ 2.8–3.5 ($n = 27$), ♀ 3.2–5.0 ($n = 15$).

Distribution. Only known from the type locality: Xishuangbanna, Yunnan, China.

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REFERENCES

- Benjamin, S. P., Dimitrov, D., Gillespie, R. G. and Hormiga, G. 2008. Family ties; molecular phylogeny of crab spiders (Araneae: Thomisidae). *Cladistics*, 24: 708–722.
- Benjamin, S. P. 2011. Phylogenetics and comparative morphology of crab spiders (Araneae: Dionycha, Thomisidae). *Zootaxa*, 3080: 1–108.
- Cambridge, O. P. 1883. On some new genera and species of spiders. *Proceedings of the Zoological Society of London*, 1883: 352–365.
- Cao, M and Zhang, J-H 1997. Tree species diversity of tropical forest vegetation in Xishuangbanna, SW China. *Biodiversity and Conservation*, 6: 995–1006.
- Dippenaar-Schoeman, A. S. 1980. The crab-spiders of Southern Africa (Araneae: Thomisidae). 2. The genera *Pherecydes* Pickard-Cambridge, 1883 and *Smolicinus* Simon, 1895. *Journal of the Entomological Society of Southern Africa*, 43: 327–340.
- Li, S-Q and Wang, X-P 2011. Endemic Spiders in China. Available from: <http://www.ChineseSpecies.com> (accessed 1 Aug. 2012).
- Murphy, F. and Murphy, J. 2000. An Introduction to the Spiders of South East Asia, with Notes on All the Genera. Malaysian Nature Society, Kuala Lumpur, Malaysia. 625 pp.
- Myers, N., Mittermeier, R. A., Mittermeier, C. G., Dafonseca, G. B. and Kent, J. 2000. Biodiversity hotspots and conservation priorities. *Nature*, 403: 853–858.
- Ono, H. 1988. A revisional study of the spider family Thomisidae (Arachnida, Araneae) of Japan. National Science Museum, Tokyo. 252pp.
- Piatnick, N. I. 2012. The World Spider Catalog, Version 13.0. American Museum of Natural History. Available from: <http://research.amnh.org/entomology/spiders/catalog/index.html> (accessed 5 Aug. 2012).
- Song, D-X and Zhu, M-S 1997. Fauna Sinica, Arachnida, Araneae, Thomisidae, Philodromidae. Science Press, Beijing. 259 pp.
- Tang, G and Li, S-Q 2009a. *Paraborboropartus* gen. nov., with description of 3 new species of crab spiders from Xishuangbanna, Yunnan, China (Araneae, Thomisidae). *Acta Zootaxonomica Sinica*, 34 (4): 712–721. [动物分类学报]
- Tang, G and Li, S-Q 2009b. Three new crab spiders from Xishuangbanna rainforest, Southwestern China (Araneae: Thomisidae). *Zootaxa*, 2109: 45–58.
- Tang, G and Li, S-Q 2009c. The crab spiders of the genus *Tmarus* from Xishuangbanna, Yunnan, China (Araneae: Thomisidae). *Zootaxa*, 2223: 48–68.
- Tang, G and Li, S-Q 2010. Crab spiders from Xishuangbanna, Yunnan, China (Araneae, Thomisidae). *Zootaxa*, 2703: 1–105.

西双版纳高峭蛛新属新种描述 (蜘蛛目, 蟹蛛科)

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摘 要 描述了采自云南西双版纳热带雨林的蟹蛛 1 新属高峭蛛属及 1 新种胶高峭蛛 *Acrotmarus gummosus* gen. et sp. nov.。新种模式标本保存在中国科学院动物研究所。

高峭蛛属, 新属 *Acrotmarus* gen. nov.

与蟹蛛科蟹蛛亚科峭腹蛛族中的其它属的主要区别在于: 后侧眼眼丘大而隆起, 雄蛛触肢插入器呈薄片状, 基部有宽缘, 其端部具 1 凹陷, 末端呈钩状。本属近似于非洲的 *Pherecydes* O. P. -Cambridge, 1883, 但有以下不同: 前者仅后侧眼在隆起的眼丘上, 后者的前侧眼、后侧眼均在隆起的眼丘上; 前者雌蛛的后侧眼间距/头胸部宽为 0.93, 后者为 1.29; 前者雌蛛前中眼间距/前中、侧眼间距为 0.97, 后者为 1.52。本属的生殖器官结构与 *Pherecydes* 差异明显: 前者雄

蛛触肢有 VTA 而后者缺乏, 前者插入器扁平片状而后者丝状; 前者外雌器有兜而后者无。

词源: 新属属名由于标本系从高层雨林冠层采集而来, 且与峭腹蛛族的属在外形上有相似性。

胶高峭蛛, 新种 *Acrotmarus gummosus* sp. nov. (图 1~3, 6~21)

正模 ♂。副模: 24 ♂♂, 15 ♀♀, 云南省西双版纳国家自然保护区勐仑保护区的热带雨林及橡胶林, 2007 年 7~8 月间, 郑国采; 1 ♂, 西双版纳勐仑镇绿石林森林公园, 2009 年 11 月 15 日, 唐果、姚志远采。

词源: 新种种名源自新种部分标本采于橡胶林冠层。

关键词 分类学, 冠层喷雾, 热带雨林, 东南亚.

中图分类号 Q959.226

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